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INSULIN AND FATAL CASES OF DIABETES.

For a year and a half the deathrate from diabetes has been declining, reversing the tendency of the four previous years during which the rate rose uninterruptedly. This change in tendency has been coincident with the increasing use of insulin. At the present time, the rate is falling faster than ever as, apparently, the use of insulin is becoming more general. Certainly, the figures to-day justify the hope that the two phenomena are connected, even though there is no positive proof, as yet, that the reduction is the direct result of the increased use of this preparation.

Deaths from diabetes, nevertheless, continue to be reported in large numbers; and it has seemed desirable to analyze the facts for fatal cases, to determine whether they had received the benefits of insulin, and if so, for how long a period before death the treatment was given. Many physicians will be interested to know what part the newer treatment has played in these cases, if any. Possibly such analysis will suggest whether there are types of cases which insulin does not help, although, of course, one would have to be very guarded in drawing so important a conclusion.

For this purpose, we have analyzed data submitted by physicians who have certified the death certificates in 500 recent cases of diabetes They give information as to whether the insulin treatment was given, the date of the first treatment and the date of the last treatment; and they also indicate the terminal condition in these cases, and whether there were any complicating or intercurrent diseases.

The following are the outstanding facts brought out by this very preliminary study:

1. Less than one-half (45.4 per cent.) of these fatal cases received insulin at any time.

77283
U.S.A.

2. In the cases that received insulin the treatment was of very short duration. In 62 per cent. of these cases, insulin was used for a period of less than one month.

3. The reason for this short duration of treatment was coupled with the late administration of the first treatment. In 31 per cent. of the cases, the insulin was administered less than one week before death.

4. Of the complications in these fatal cases, coma was the most frequent, being certified in 46 per cent. of the cases. Arteriosclerosis was reported in 24.8 per cent., chronic nephritis in 23.4 per cent., and gangrene in 23.4 per cent. In a large number of the cases, two or more of these complications were present conjointly.

Insulin apparently was most actively used in cases which were complicated by coma. But apparently in these cases, the administration was already too late. In a series of 58 cases where no other complication than coma was present, 21 were not given a single dose of insulin.

5. Insulin was apparently much more commonly used in cases receiving hospitalization than in cases where treatment was given at home.

6. Finally, insulin is more extensively used in the larger centers of population than in the rural areas or smaller towns. In the former, about half the cases received insulin, whereas in the rural areas only about one-third received insulin.

From the above, it would appear warranted to conclude that there is no particular type of diabetes which does not justify the use of insulin, but rather that an unsatisfactory result can be largely ascribed to the absence of treatment; or to the very late use of the treatment; or to lack of cooperation or ignorance of the patient, which result in indiscretions with fatal results; or to complications of fatal chronic diseases which, by themselves, are sufficient to cause death.

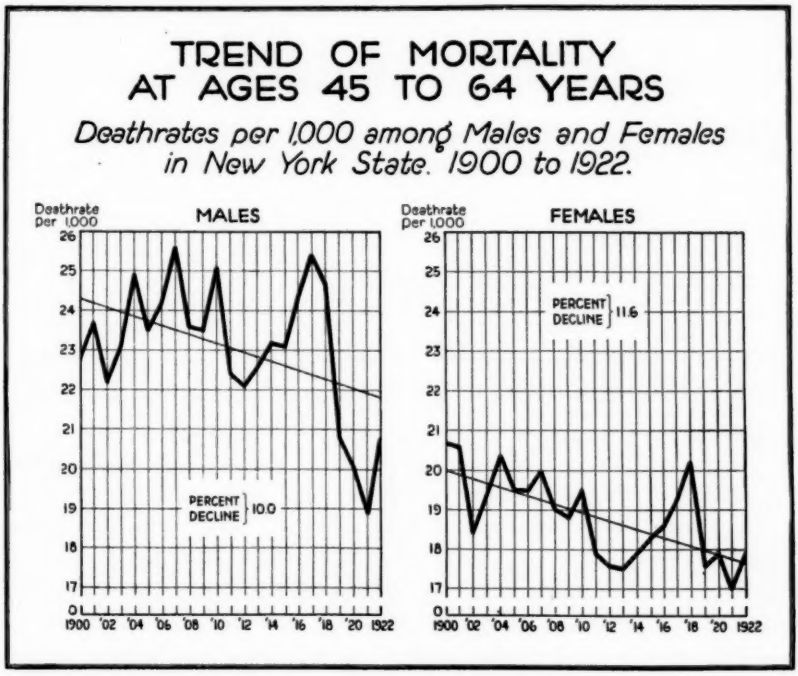
Observation is being continued on such cases and a later report will follow.

DECLINING MORTALITY AFTER 45 YEARS OF AGE.

More than ordinary caution is required to interpret accurately secular changes in mortality rates. For some time after 1910, the increases of the deathrates in middle life over the figures for 1900, were the occasion for considerable speculative comment. Much of this comment was frankly pessimistic. It was freely stated that the stress and strain of contemporary civilization was possibly

exacting a heavier toll than formerly among a group of the population in the prime of life. That such conclusions were perhaps premature is shown by some facts recently collected on the course of mortality among males and females in New York State at the ages between 45 and 64 years for the period between 1900 and 1922.

For males at this age division, we found an aggregate drop of 2.44 deaths per 1,000 of population in this period, or 10.0 per cent. between 1900 and 1922; in this same span of years, the aggregate fall of the deathrate for females at this age division was 2.33 deaths per 1,000 of population, or 11.6 per cent. These calculations are based upon the trend-lines for the twenty-two-year period, and these trend-lines detect fundamental tendencies.



For males between 45 and 64 years of age, there were three distinct changes in the trend of the deathrate: first, a gradual increase between 1900 and 1911; second, a sharper increase between 1912 and 1917; third, a pronounced decrease between 1918 and 1921. The improvement in the deathrate since 1918 has more than offset the increases between 1900 and 1917. The facts dis-

Deathrate per 1,000 at Ages 45 to 64 Years. By Sex. New York State, 1900 to 1922.

YEAR	MALES	FEMALES
1922	20.8	17.9
1921	18.9	17.0
1920	20.1	17.9
1919	20.8	17.6
1918	24.7	20.2
1917	25.4	19.3
1916	24.3	18.6
1915	23.1	18.3
1914	23.2	17.9
1913	22.6	17.5
1912	22.1	17.6
1911	22.4	17.9
1910	25.1	19.5
1909	23.5	18.8
1908	23.6	19.0
1907	25.6	20.0
1906	24.2	19.5
1905	23.5	19.5
1904	24.9	20.4
1903	23.1	19.4
1902	22.2	18.4
1901	23.7	20.6
1900	22.8	20.7
Average annual fall of deathrate per 1,000	−.111	−.106

closed by this review for the twenty-two-year period show that misleading conclusions as to fundamental conditions can be drawn from insufficient data covering only parts of a calendar period.

Females between 45 and 64 years of age in New York State showed a falling deathrate between 1900 and 1912; a sharply rising rate between 1913 and 1918; and a decline in deathrate from 1918 to 1922. In passing, it is noteworthy that the mortality of the women is much lower than that of the men, the rates for men in 1922 being about the same as for women in 1900.

Provisional information seems to indicate that most of the improvement in recent years in the deathrates at this age division of life arose out of lowered mortality from tuberculosis and pneumonia. Further declines may be expected, especially for cardiac, vascular and renal diseases, which are dependent to some extent upon septic injury to tissue, because of the remarkable reduction in acute infections among younger persons during the past two decades. As this population enters the ages beyond 45 years, there will be fewer

instances of damaged heart, vascular and renal tissue, and consequently lower deathrates from endocarditis and the other conditions which follow sepsis. Considerable gains may be expected, also, from the practice of identifying and treating focal infections.

A further source for reduction in the mortality of middle life lies in the increasingly popular practice of periodic medical examination and in the revision of personal hygiene which follows these annual health inventories. Premonitory conditions are recognized before serious damage is done; modes of life are changed; undue fear is allayed; and, in general, the whole tone of life is raised among persons who are wise enough to employ hygienic counsel. Among policyholders of the Metropolitan Life Insurance Company examined in 1914–1915, the deathrate in six years succeeding these examinations was 28 per cent. lower than the expected mortality in this group. If a similar procedure were to be adopted by the millions of men and women in the general population, a substantial reduction in mortality would probably ensue.

Altogether, the outlook for the longevity of middle-aged persons is now very favorable.

AUTOMOBILE FATALITIES AMONG INSURED WAGE-EARNERS IN AMERICAN STATES AND CANADIAN PROVINCES, 1923.

Among the fifteen million Industrial policyholders of the Metropolitan Life Insurance Company in 1923 there occurred 136,511 deaths. This is the number of deaths from **all causes**—the combined total from disease and from accidental, homicidal and suicidal violence.

Among these 136,511 persons who died were no less than 2,242 who lost their lives in automobile accidents. This corresponds to a little over 1.6 per cent.—or sixteen out of every 1,000 who died!

From all kinds of accidents combined there occurred 9,259 deaths, so that the 2,242 chargeable to the operation of automobiles constituted almost one-fourth of the total accident mortality. Included among all these accidental deaths, beside automobile fatalities, are all the poisonings, the deaths by burns and in burning buildings, the asphyxiations by gas, the accidental shootings, cuttings and falls, the deaths in mines, quarries, and by machinery, the railroad and street car accidents, and the accidents due to all other vehicles, the injuries by animals and the deaths due to excessive cold, to heat stroke, to lightning and to other electrical shocks, and there was one

automobile fatality to every three of those occurring from all these other forms of accident combined!

Obviously, there is much interest in the geographic distribution of these deaths, and we are now in a position to give the figures for the individual American states and Canadian provinces.* The highest mortality from automobile accidents in any geographic division in 1923 was experienced in the Pacific Coast States (22.8 per 100,000). This is due, almost altogether, to the very high mortality in California (25.8). The figure for the State of Washington is only a little above that for the United States, while that for Oregon is one of the lowest in the country.

Next to the Pacific Coast States, the Middle Atlantic States show the most unfavorable record for automobile fatalities. Here, the mortality was 17.7 per 100,000. While all three states show deathrates considerably above the average for the whole country, New Jersey recorded a figure much higher than either New York or Pennsylvania.

The East North Central States, with a rate of 17.1 per 100,000 for automobile fatalities, showed the next most unfavorable record. In this group the states with conspicuously high deathrates were Michigan (20.6 per 100,000), and Ohio with 19.1.

The above three geographic divisions are the only ones which showed automobile accident deathrates in excess of the average for the United States (16.4). In several of the other divisions, however, there were conspicuous examples of states whose high deathrates for automobile casualties stand out from the others. In New England for example, New Hampshire, with a rate of 19.9, showed the fourth highest figure in the United States. Among states having high deathrates in the South Atlantic Division, Florida, with a rate of 32.5, recorded the highest figure for either the United States or Canada; while North Carolina, with a rate of 19.8, stood fifth. The rates for Delaware and Maryland were also above-average.

Every state in the Mountain and West South Central regions recorded automobile accident deathrates well below the average for the industrial population of the United States; so did every state in the East South Central and West North Central regions with the exception of Tennessee and Minnesota. These last two states each recorded rates of 16.4 per 100,000, which is identical with that for the United States. The lowest deathrates were recorded in the Western Provinces of Canada (6.3); and the mortality in the Eastern Provinces

*The Industrial policyholders, it should be remembered, live, almost altogether, in the cities' where they comprise about one-quarter of the entire wage earning population.

(7.9) was also much lower than for any of the geographic divisions of the United States.

A number of states and provinces recorded conspicuously low deathrates from automobile accidents. Not a single death was recorded from this cause in Manitoba and Saskatchewan. In the Province of Ontario the very low figure of 5.8 per 100,000 was registered; in Nova Scotia, 6.9; and in British Columbia, 7.1. The lowest rate in the industrial populations of any American state was that for West Virginia (7.0); and other low figures were those for Idaho (8.9); Utah (9.1), and Maine (9.5).

All of the rates quoted above relate to white persons. The mortality from automobile accidents ran somewhat lower among the colored. In a few states, however, the contrary held true. In the South Atlantic group of states there was very little difference between the deathrate for whites (15.3) and that for the colored (14.3). The mortality for the two races was also almost identical in the West North Central group.

The above figures, relating as they do to the industrial population, conform strikingly to those developed by the study of Mr. H. P. STELLWAGEN relating to automobile fatalities in the United States as developed from statistics for 135 American cities. Among the Industrial policyholders, for example, the maximum deathrate was that for Florida. In Mr. STELLWAGEN'S study he showed conspicuously high automobile deathrates for a number of Florida cities, notably, Miami (57.5 per 100,000); Tampa (25.0), and Jacksonville (21.0). The second highest rate for the Metropolitan policyholders was that for California where Mr. STELLWAGEN shows deathrates of 35.6 for Los Angeles; 31.8 for Long Beach, and 42.9 for Sacramento, and a figure of 18.8 for San Francisco which, while not conspicuously high, was nevertheless, above-average. The state with the third highest rate among Metropolitan policyholders is Michigan, where Mr. STELLWAGEN shows rates of 25.8 for Detroit; 20.1 for Saginaw, coupled with close to average rates for a number of other Michigan cities. The high automobile deathrate in New Jersey checks fairly well with the following high rates for a number of cities in that state—Camden (33.8); Newark (23.5); Kearney (23.6); Trenton (25.1), and Passaic (20.9); and the high figure of 19.1 among Ohio Metropolitan Industrial policyholders would not be unexpected in view of Mr. STELLWAGEN'S figures of 30.3 for Cincinnati; 22.4 for Cleveland; 21.4 for Columbus; 34.6 for Lorain, and 22.0 for Toledo. New York's above-average deathrate checks fairly well with Mr. STELLWAGEN'S

figures for some of the larger cities in that state, namely, Buffalo (26.5); Binghamton (25.9); Albany (22.2); New Rochelle (20.6), and Schenectady (22.3).

Deathrates per 100,000 Persons Exposed. Automobile Accidents. By Geographic Division, State and Province. Metropolitan Life Insurance Company, Industrial Department, 1923. (Excluding Infants under One Year of Age.)

Geographic Division	Rates per 100,000	
	White	Colored
Total Company	15.8	13.0
United States	16.4	13.0
New England	13.6	3.7
Maine	9.5	*
New Hampshire	19.9	*
Vermont	14.5	*
Massachusetts	14.0	3.9
Rhode Island	14.4	*
Connecticut	11.7	6.8
Middle Atlantic	17.7	13.8
New York	17.5	16.1
New Jersey	19.2	13.1
Pennsylvania	17.1	12.3
East North Central	17.1	14.9
Ohio	19.1	17.9
Indiana	12.8	13.3
Illinois	16.3	14.8
Michigan	20.6	13.6
Wisconsin	13.0	†
West North Central	13.4	13.2
Minnesota	16.4	30.0
Iowa	15.2	5.3
Missouri	12.4	15.5
Nebraska	13.8	9.6
Kansas	12.5	8.0
South Atlantic	15 3	14.3
Delaware	17.7	19.3
Maryland	17.4	15.2
District of Columbia	11.7	24.3
Virginia	12.0	13.2
West Virginia	7.0	19.0
North Carolina	19.8	10.7
South Atlantic (Cont.)		
South Carolina	12.3	15.1
Georgia	14.6	6.9
Florida	32.5	20.7
East South Central	14.1	9.1
Kentucky	12.9	13.3
Tennessee	16.4	4.5
Alabama	12 5	9.2
West South Central	12.3	7.1
Arkansas	11.2	7.4
Louisiana	12.2	5.2
Oklahoma	13.5	†
Mountain	11.0	*
Montana	11.6	*
Idaho	8.9	*
Colorado	15.4	*
Utah	9.1	*
Pacific	22.8	16.3
Washington	16.9	†
Oregon	10.3	56.9
California	25.8	17.0
Canada	7.8	*
Eastern Provinces	7.9	*
Nova Scotia	6.9	*
New Brunswick	10.4	*
Quebec	9.4	*
Ontario	5.8	*
Western Provinces	6.3	*
Manitoba	†	*
Saskatchewan	†	*
Alberta	19.4	*
British Columbia	7.1	*

*Deathrate not calculated on account of small number of colored policyholders.
†No deaths.

HEALTH RECORD FOR JUNE, 1924.

The health record of the fifteen million Industrial policyholders of the Metropolitan for June, 1924, was the best ever recorded for that month. The rate was 9.0 per 1,000. This identical rate was registered in June of 1922; but the 1924 figure is actually a new minimum, for it was recorded despite the inclusion of infant lives, with their relatively high deathrate, among those insured. No business of this class was carried in 1922. The above rate marked a slight fall from the figure for the preceding month (9.3). We always expect, however, a seasonal decline in the June rate as compared with that for May.

Among the principal causes of death in the table on page 11 there are really only two unsatisfactory items as compared with June of last year. These are the increases for cancer and automobile fatalities. The higher figures shown for pneumonia and diarrheal diseases are accounted for by the relatively high mortality among infant lives from these causes. Automobile fatalities, however, rose 45 per cent. as compared with May, and the rate was higher than in June of last year. We called attention last month to the fact that automobile fatalities were fewer in May than during the same month of either 1923 or 1922, but we suggested that this decline might be temporary, and that it was probably due to curtailed automobile traffic as the result of unseasonable weather conditions. This surmise seems to be borne out by the considerable rise in the deathrate in June.

The deathrate for the general population of the large cities of the United States during June was 11.9 per 1,000, which is considerably lower than the figure for the previous month and slightly below the rate for June, 1923 (12.5). More cases of malaria and typhoid fever were reported in June than in May, but there was less diphtheria, influenza, measles, scarlet fever, smallpox, and whooping cough. Compared with June a year ago, malaria, scarlet fever, smallpox and typhoid fever were more prevalent, while there were not so many cases of diphtheria, influenza, measles and whooping cough.

The smallpox situation, by and large, is unfavorable. The Detroit outbreak, it is true, seems to have subsided, but the presence of the disease at other Michigan points resulted in an order by the State Board of Health prohibiting the exhibition or transportation of circuses, street fairs and carnivals without written permit from the Board. The annual State Epworth League Institute was postponed indefinitely. In Ohio, the State Director of Health asked the co-operation of the Cleveland and other Chambers of Commerce in preventing further inroads of smallpox in northern Ohio. In Toledo,

employers have been requested to insist on vaccination of their employees and every pupil in the city schools must be vaccinated by September. Nine deaths from smallpox were reported during May and June. In upper Sandusky 100 persons out of a population of 5,000 were stricken and all church services, motion picture shows and public gatherings were forbidden. There was an outbreak in a construction camp at Kenton, Ohio, and six cases occurred among negro residents of a street in the east end of Cincinnati. In Illinois, there has been an increase in smallpox cases, the counties of Cook, Douglas, Franklin, Lane, McLean, Madison, Rock Island and Whiteside being affected most. Quite a number of cases were reported from Murray Corner and Chatham, Ontario.

Among the more prominent public health activities reported during June were the following: A campaign to wipe out trachoma will be started July 1 by the Indian Office and the United States Public Health Service. The plans provide for beginning operations in Arizona and New Mexico with extension ultimately to all Indian reservations. The Rockefeller Foundation has recently granted the sum of $75,000 to the Canadian National Committee for Mental Hygiene, to be used for research, experimentation and administration. It is understood that a similar amount will be forthcoming from Canadian sources. The New York City Health Department announced that through the cooperation of the Bureau of Laboratories and the Bureau of Preventable Diseases the Dochez serum treatment will now be offered to scarlet fever contacts. Children exposed to the disease will be visited by a physician from the laboratory who, with the approval of the family physician, will administer the serum. The Quebec Health Bureau announced that two new dispensaries will be opened within a few weeks as a part of its campaign to avoid tuberculosis. This will make ten such dispensaries in operation.

The table on page 11 shows the mortality among Industrial policyholders for June, 1924; May, 1924; June, 1923, and for the year 1923.

METROPOLITAN LIFE INSURANCE COMPANY.

Deathrates† per 100,000 for Principal Causes, Premium-paying Business in Industrial Department. (Annual Basis.)

MONTHS OF MAY AND JUNE, 1924, AND OF JUNE, 1923.

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED†			
	June, 1924	May, 1924	June, 1923	Year 1923*
TOTAL—ALL CAUSES	903.6	931.2	916.4	923.9
Typhoid fever	4.0	2.4	4.2	5.1
Measles	7.8	9.9	18.2	9.4
Scarlet fever	5.0	6.2	4.4	4.4
Whooping cough	7.2	7.7	9.3	7.4
Diphtheria	9.1	9.5	9.2	15.5
Influenza	11.3	18.3	12.5	30.2
Tuberculosis (all forms)	112.0	108.5	121.1	109.6
Tuberculosis of resp'y system	100.1	98.9	109.6	99.2
Cancer	73.9	64.8	70.1	71.5
Diabetes mellitus	13.7	15.9	15.1	15.9
Cerebral hemorrhage	56.7	64.4	55.5	61.0
Organic diseases of heart	128.0	126.4	125.1	126.7
Pneumonia (all forms)	81.8	101.0	65.1	83.5
Other respiratory diseases	13.7	16.6	13.4	13.9
Diarrhea and enteritis	23.6	20.2	20.8	28.1
Bright's disease (chronic nephritis)	63.9	66.6	70.6	68.5
Puerperal state	14.8	17.1	17.5	17.6
Suicides	7.6	8.0	8.7	7.3
Homicides	5.5	5.2	6.4	7.2
Other external causes (excluding suicides and homicides)	61.4	52.8	63.6	62.7
Traumatism by automobile	16.2	11.2	15.6	15.2
All other causes	202.7	209.8	205.4	178.6

* Based on provisional estimate of lives exposed to risk in 1923.
† All figures include infants insured under one year of age.

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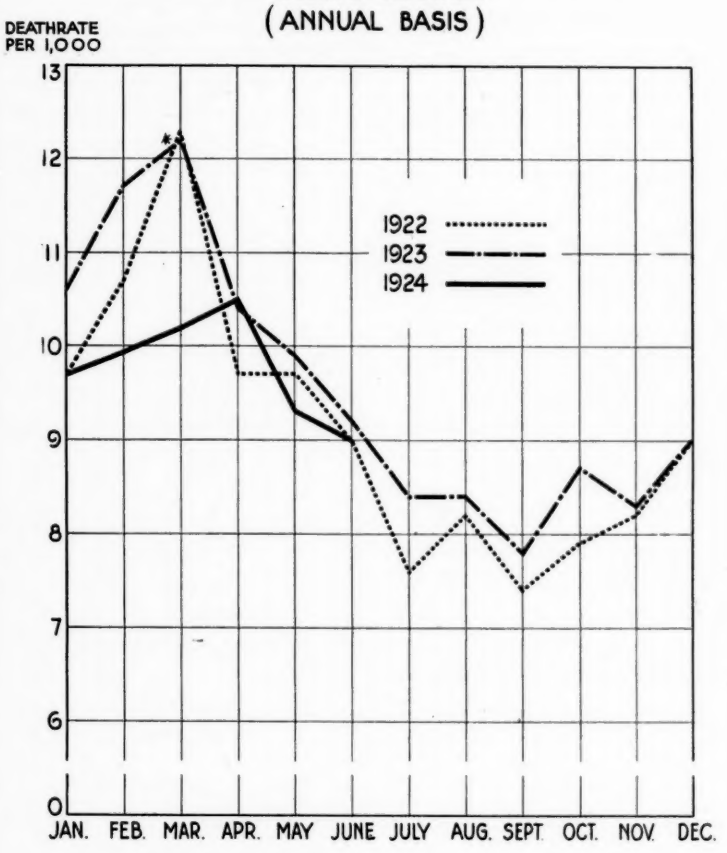
DEATHRATE PER 1,000 *in* SPECIFIED MONTHS *of* 1922, 1923, 1924

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT

(ANNUAL BASIS)



	1922	1923	1924		1922	1923	1924
JAN.	9.7	10.6	9.7	JULY	7.6	8.4	
FEB.	10.7	11.7	9.9	AUG.	8.2	8.4	
MAR.	12.3	12.2	10.2	SEPT.	7.4	7.8	
APR.	9.7	10.4	10.5	OCT.	7.9	8.7	
MAY	9.7	9.9	9.3	NOV	8.2	8.3	
JUNE	9.0	9.2	9.0	DEC.	9.0	9.0	

* Beginning with March, 1923, figures include mortality of infants under one year of age.

77297
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